Minutes of the Joint EHC/IHEC Meeting to Review ORIA's Report on A Methodology for Ranking Indoor Air Pollutants

July 19, 2001

U.S. Environmental Protection Agency
Science Advisory Board
Westin Hotel
Cincinnati, Ohio

The Environmental Health Committee (EHC) and the Integrated Human Exposure Committee (IHEC) of the US EPA Science Advisory Board (SAB) met in joint session on July 19, 2001, at the Westin Hotel, Cincinnati, Ohio. The meeting was announced in the Federal Register at FR Vol. 66, Number 127, July 2, 2001, pp. Page 34926 (Attachment A). The proceedings followed the agenda (Attachment B) with minor deviations. The purpose of the meeting was to provide advice and comment to the EPA on issues related to a proposed methodology for ranking indoor air pollutants in terms of the hazard they pose to humans. The Agency seeks advice from the SAB Joint Committee on a range of issues, focusing on the suitability of the methodology for the purposes of the ranking analysis; the criteria used to select the monitoring studies for the analysis; and the adequacy of the descriptions of the methodology for selection of the "risk-based concentrations" and of the limitations and uncertainties of the analysis.

Tuesday, July 19, 2001

Convene the Meeting Drs. Anderson and Utell, Co-chairs, convened the meeting at 9:05 a.m. and welcomed all the attendees. The Co-chairs discussed briefly the issues before the Joint Committee. They then addressed activities at the recent meeting of the SAB Executive Committee, and current issues concerning the selection of participants on SAB panels. After a brief discussion of administrative issues and the Federal Advisory Committee Act (FACA) and its requirements by the Designated Federal Officer (DFO), the Chair asked each Member, Consultant, and Federal Expert on the Subcommittee to identify him/her self, their organizational affiliation, research interests, and to state if they had identified any possible conflict of interest concerning the matters to be discussed by the Subcommittee. No such issues were identified.

The following Members and Consultant served on the Joint Committee: (Co-chairs) Drs. Henry A. Anderson and Mark Utell; (Members) Drs. Annette Guiseppi-Elie, Paul Foster, Michael Jayjock, George Lambert, Grace Lemasters, Abby Li, Ulrike Luderer, Randy Maddalena, Barbara J. Petersen, Jed M. Waldman, and Charles J. Weschler; (Consultant) Dr. Stephen Brown. Mr. Samuel Rondberg served as the Committee Designated Federal Officer. The Subcommittee roster is provided as Attachment C

Agency staff and public attendees are noted on the sign in sheets (Attachment D)

Background of the Issues

The meeting opened with a presentation by Dr. Pauline Johnson of the EPA Office of Radiation and Indoor Air (ORIA). (handouts for her presentation is incorporated as Attachment E)

One member of the public, Dr. Hal Levin, then made a brief oral statement to the Joint Committee (no written statement provided).

Following the Public Comment, the Subcommittee turned to the substantive issues for the review. The following brief paragraphs attempt to capture the overall conclusions of the Joint Committee's deliberations on each issue, not every nuance raised in the course of (frequently) lengthy discussions.

The first element of the Charge addressed the suitability of the overall methodology for the ranking analysis. The Joint Committee noted that there are many uses for a quick screening tool that utilize surrogates for exposure and associated risk, but that such screening tools themselves do not assess exposure or risk. The Members felt it was important that it the final report provide a clear description of the uses that are suitable for this tool and those that are not.

The proposed approach could provide "order-of-magnitude" type rankings, and the Joint Committee agreed that the incorporation of both exposure and toxicity measures was appropriate. The Committee discussed the specific substances that were included in the ranking as well as the suitability of the underlying data.

Members also noted that the suitability of the method for assessing "air toxics" is dependent on the definition of the term, and that many airborne substances (including biologics, radon and particulates) found in the residential environment that are excluded from the current ranking method. Also, the proposed method makes no estimate of the potential population exposures (e.g. numbers of people) nor for the frequency or duration of exposure. Duration of exposure is potentially important.

Other points raised included the ranking of carcinogens and non-carcinogens separately, the limitations of the existing data, the reliability of the underlying data for both exposure and risk based concentrations, and the need to consider incorporating the sources of indoor air toxics and the type of building under consideration.

The second Charge issue dealt with the use of the underlying studies for the ranking analysis. The participants felt that the criteria used to select the monitoring studies for the analysis should be much better defined, and the BASE and SIS studies discussed and properly referenced.

Discussing the suitability of the studies, the Joint Committee noted that, if the question is whether the studies provide an informative case for demonstrating the ranking methodology with a limited set of chemical then the selected studies are adequate. However, if the goal is to provide a ranking across the universe of chemicals in the indoor environment then the selected studies clearly fell short. Given the severe limitations of direct monitoring data, it might be advisable to consider supplementing the approach with a "screening level" indoor fate and exposure model to draw upon other sources of information (i.e., emissions data, chemical use data, activity data).

The Members also found that the treatment of uncertainty in the report is somewhat inconsistent. In addition to variability across similar building types, the sources, distribution processes and removal mechanisms for indoor pollutant will vary between residences, office buildings and schools.

Joint Committee Members expressed concerns about using the difference between indoor and outdoor concentrations as a surrogate for identifying indoor sources, which can overestimate the influence of outdoor sources resulting in a lower ranking for a given indoor pollutant. For the chemicals included in this ranking, using the indoor/outdoor difference did not seem to significantly alter the ranking for the chemicals in the upper 20%. Therefore, to reduce the chance of removing a potentially important

chemical from the list, the Panel suggests that all of the chemicals measured in the indoor air be included in the ranking process but those suspected of being predominantly of outdoor origin can be flagged or identified in the text.

The third Charge element addressed the methodology for selection of the "risk-based concentrations. The Joint Committee was generally satisfied that the methodology is reasonable for the purposes of ranking, but there were a few concerns and several suggestions for improvement.

Concern was expressed that there may be insufficient data to examine effects of indoor air toxics on children since the Risk Based Concentration (RBC) were mostly related to adult animals. Identifying the RBC used based on adult versus childhood data will help to explain the limitation of these RBC. Given that children and pregnant adults are the most susceptible populations in the indoor environment additional consideration should be given as to the impact of these rankings on these two groups. A dual ranking priority system (one designed for susceptible populations and another for less susceptible groups) could be provided. Concern was also expressed that use of a purely hierarchical selection process when there are several available RBCs seems to waste information.

The last element of the Charge addressed the adequacy, limitations, and uncertainties of the analysis. There was a consensus that ORIA should be sure that the quality of the ranking system matches the needs of the uses to which it will be put. The current approach only addresses that part of the universe of indoor air toxics that are "under the lamppost" in the sense of having sufficient data available for ranking with the current algorithm. The Joint Committee noted that use of default values or model results for missing data could expand the universe to be ranked, but of course with correspondingly uncertain results. Such a strategy could at least help identify those pollutants that *could* be important, and suggest where research might have the greatest payoff. As it stands, the system is more useful as a screening exercise to identify those pollutants that are not likely to be high in risk relative to the highest ranking of the qualifying pollutants. It may not be adequate to identify a few indoor air toxics that deserve significant resources for development of a control strategy.

The Members noted that, with a few exceptions, the document adequately describes and discusses the major uncertainties of the analysis in qualitative terms. Improvements in the treatment that might enhance the utility of the document and its transparency to readers could include: a) a better statement about what constitutes adequacy, limitations, and uncertainties for a ranking system; b) some discussion of quantitative measures of uncertainty; c) a better explanation of the superiority of monitoring data to model results; d) the treatment of the exposure of children or other subpopulations; e) more consistent treatment of uncertainty; and f) inclusion of a sensitivity analysis.

Following discussion of report preparation, the Co-chairs adjourned the meeting at 3:50PM.

I certify that these minutes are accurate to the best of my knowledge.

/s/
Dr. Mark Utell
Co-Chair

/s/
Dr. Henry Anderson
Co-Chair

/s/
Mr. Samuel Rondberg
Designated Federal Officer